

NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD

WETLAND RESTORATION

(Acre)  
Code 657



**DEFINITION**

A rehabilitation of a drained or degraded wetland where the soils, hydrology, vegetative community, and biological habitat are returned to the natural condition to the extent practicable.

**PURPOSE**

To restore hydric soil conditions, hydrologic conditions, hydrophytic plant communities, and wetland functions that occurred on the wetland site prior to conversion to the extent practicable.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies only to sites with hydric soil which formerly were natural wetlands that have been converted.

Upon completion of the restoration the site will meet, to the extent practicable, the current NRCS soil, hydrology, and vegetation criteria of the wetland type that historically existed on the site.

This practice is applicable only if site conditions make it practicable (environmentally and economically) to modify current hydrologic parameters to approximate historic natural hydrologic conditions.

If the presence of hazardous materials or contaminants is suspected, soil samples will be collected and analyzed for their presence as defined by local, state, or federal authorities. Sites containing hazardous materials will not be restored under this standard.

This practice does not apply to: Constructed Wetland (Code 656) intended to treat point and non-point sources of water pollution; Wetland Enhancement (Code 659) intended to rehabilitate a degraded wetland where specific functions and/or values are increased; or Wetland Creation (Code 658) for creating a wetland on a site location which historically was not a wetland.

**CRITERIA**

**General Criteria**

The landowner shall obtain all applicable local, state, and federal permits before implementing restoration measures.

Water rights and availability are assured prior to restoration if required.

The soil, hydrology and vegetative characteristics existing on the site and in the contributing watershed shall be documented before restoration of the site begins. Note relevant features of the contributing landscape such as water and sediment movement patterns, fire regime, etc.

The design will not back water or discharge water onto neighboring land without an easement or permit.

The potential for occurrence of threatened or endangered species and/or designated critical habitats shall be evaluated for each site proposed for restoration. When planning to restore sites containing these species or habitats, follow normal consultation procedures with the US Fish & Wildlife Service and state/local authorities before initiating restoration practices.

#### **Criteria for Hydric Soil Conditions**

Restoration sites will be located on hydric soils. An approximation of the original soil microtopography will be reestablished.

If the hydric soil is covered by fill, sediment, spoil, or other depositional material, the material covering the hydric soil shall be removed only to the surface of the buried (original) hydric soil.

Where the hydric soil elevation has been lowered due to oxidation and/or compaction, fill material will be added to approximate the original hydric soil elevation, except where water levels will be managed to compensate for the soil loss.

#### **Criteria for Hydrology Restoration**

A reliable water supply shall be available that will supply the needs of the restored wetland. The hydrology of the site is defined as the rate, path, timing of inflow and outflow, duration, frequency, and depth of flooding, ponding or saturation required to support the desired wetland type.

The hydrology characteristics, including the overall hydrologic variability of the restored wetland, will approximate as closely as possible the conditions that existed before conversion.

NRCS conservation practice standards for Dike, Code 356 and Structure for Water Control, Code 587 will be used as appropriate. Refer to the Engineering Field Handbook, Chapter 13, "Wetland Restoration, Enhancement, and Creation," and Chapter 6, "Structures," for additional design information. Existing drainage systems will be utilized,

removed, or modified as needed to achieve the intended purpose. Pumping of groundwater shall not be utilized as a water supply source.

#### **Criteria for Vegetation Restoration**

The vegetation shall be restored as closely to the historic native plant community as the restored site conditions will allow. Determination of the historic plant community's species and percent composition shall be based upon reference wetlands (i.e., wetlands in the same watershed and of the same type being restored that function at the level desired on the restoration site) and/or other suitable technical references.

Planting, seeding, or other types of vegetative establishment will be comprised of native species that occur on the wetland type being restored.

Preference shall be given to use of localized plant genetic material. Plant materials collected or grown from material collected within the major land resource area (MLRA) are considered local.

In soils where seed banks realistically exist, or where natural colonization of selected native species (identified from reference wetlands) will dominate within five years, natural regeneration may be allowed.

Specification of adequate substrate material and site preparation necessary for proper establishment of the selected plant species shall be included in the design.

Where planting and/or seeding is necessary, the density, distribution and diversity of species to be restored shall be based upon the predominant native species present in the reference wetland, or appropriate technical reference. At a minimum, restoration of herbaceous community types will require establishment of at least two species of wetland vegetation per type. For forested or shrub wetland communities, restoration will require establishment of a minimum of three tree/shrub species for each community type.

Herbaceous vegetation may be established by a variety of methods including: mechanical or aerial seeding, topsoiling, organic mat placement, wetland sod, vegetative sprigs or transplants, etc., over the entire site or a

portion of the site and at densities and depths as appropriate.

Tree (and shrub) planting, planting rates and site preparation will meet the criteria of NRCS conservation practice standard Tree/Shrub Establishment, Code 612. Seed viability will be determined prior to planting.

Long term (i.e., at least five years) survival of desired species on the restoration site shall typically be a minimum of 80% (areal coverage) of herbaceous species and 80% (stem count) of woody species. Long term allowable invasive/exotic plant species coverage shall be limited to < 15% combined areal and stem count coverage. These species shall include plant species listed on the Florida EPPC List of Florida's Most Invasive Species, Category I.

#### **Criteria for Wetland Functions**

Prior to restoration, a functional assessment (Hydrogeomorphic Approach as outlined in the National Food Security Act Manual, Wetland Rapid Assessment Procedure published by South Florida Water Management District, or similar approved method) shall be performed on a nearby reference wetland in order to target desired functioning levels for the restoration site.

Restoration goals and objectives shall include natural wetland functions appropriate to the wetland type and the site location as determined by functional assessment, and/or other technical references as appropriate (e.g., Wetlands Reserve Program National Handbook).

Monitoring of restoration success shall occur at least annually during the first five years after establishment of the restoration. Adaptive modification shall be made if necessary to achieve the stated goals of the restoration.

A post-project evaluation will be performed to assess the degree of success of the restoration. Functional assessments shall be performed as part of the monitoring and post-project evaluation to help evaluate success.

#### **CONSIDERATIONS**

Consider the effects of restoration on downstream flows or aquifers that would affect other water uses or users.

Consider establishing and maintaining vegetative buffers on adjacent uplands to protect and enhance wetland functions such as water quality enhancement, floodwater storage and wildlife habitat.

Consider restoring sites adjacent or in close proximity to existing wetlands as they may offer increased wetland system complexity and diversity, lessen habitat fragmentation, and help ensure colonization of the site by desirable wetland flora and fauna.

Consider the effect of volumes and rates of runoff, infiltration, evaporation, and transpiration on the water budget of the wetland.

Evaluate the potential for a change in rates of plant growth and transpiration because of changes in the volume of available soil water.

Consider the effects of varying water levels in response to potential climatic events such as extreme wet or dry periods.

Consider changes in salt movement/concentrations in the soil resulting from hydrologic alterations.

The nutrient and pesticide tolerance of the plant species planned should be considered where known nutrient and pesticide contamination potential exists. Remediation of areas contaminated by pesticides will be needed prior to restoring wetlands that will attract wildlife.

Consider long term groundwater source availability in areas where numerous or large capacity consumptive use wells may lower regional groundwater tables.

#### **PLANS AND SPECIFICATIONS**

Specifications for this practice shall be prepared for each site. Specifications shall be recorded using approved specifications sheets, job sheets, narrative statements in the conservation plan, or other documentation. Requirements for the operation and

maintenance of the practice shall be incorporated into site specifications.

## **OPERATION AND MAINTENANCE**

The following guidelines shall be followed to insure that this practice functions as intended throughout its expected life. These include performance of normal repetitive activities in the application and use of the practice (operation), and repair and upkeep activities for the practice (maintenance).

Any use of fertilizers, pesticides and other chemicals shall not compromise the functioning of the restored wetland.

Biological control of nuisance and invasive/exotic plant species and pests (e.g., using predator or parasitic species) shall be implemented where available and feasible.

Water control structure levels will be set and timed as appropriate to allow for the establishment of desired hydrologic conditions and/or for management of vegetation for the specific desired ecological communities.

An inspection schedule will be established for water control structures, embankments, berms, etc. to periodically assess for damage.

Allowable sediment accumulation depths will be determined if periodic sediment removal is required for long term viability of the site.

Management activities such as prescribed burning or mechanical treatments will be scheduled when and where needed to maintain the vegetative composition and structure of the desired wetland type(s), including control of invasive/exotic and nuisance vegetation.

## **REFERENCES**

NRCS Conservation Practice Standards:  
Dike, Code 356  
Structure for Water Control, Code 587  
Tree/Shrub Establishment, Code 612

NRCS Engineering Field Handbook, Chapters 6, 13.

Wetland Rapid Assessment Procedure (WRAP). Tech. Pub. REG-001, Second Edition, April 1999, South Florida Water Management District

List of Florida's Most Invasive Species (annually updated). Florida Exotic Pest Plant Council ([www.fleppc.org](http://www.fleppc.org)).